Process for the automatic production of a processor from
a machine description

<u>Patent claims</u>

1. The invention concerns a process for the production of an SIMD processor, which contains common control signal sharing disks for the processing of different data respectively, in which the geometry of the processor is produced at least indirectly from a machine description, which consists of a database, contains definitions of several functional units, consist of at least parameters of the number and types of the inputs and outputs and the connection of the functional units with other functional units *characterised by the fact* that an altered machine description is produced and used as the basis for the production of the geometry of the SIMD processor (14) in such a way that functional units are selected from a criterion in the machine description, which are vector-processible, that a first or second reduced functional unit (3) , (4) are selected defined from a respective vector-processing functional unit (9), in which the reduced functional units process only a data element of a vectoral value (13) as component of the respective vector-processing functional unit (9), that all reduced functional units, which use common control signals for the processing of a data element belonging to the vectoral value (13) respectively, are condensed to a disk, that reduced functional units, which process the same data elements in a sequence at least indirectly, are condensed to a disk module, that the respective disk is arranged repeatedly in such a way that the disk with the contained reduced functional units is reproduced so often that all reduced functional units represent the functionality of their respectively selected vector-processing functional unit (9).

2. Process according to claim1 *characterised by the fact* that the criterion in the machine description represents the type of the inputs and/or outputs or the functionalities, as long as these are defined in the machine description.

3. Process according to claims 1 and 2 *characterised by the fact* that
disks are combined to a respective disk module (11), that the respective disk module (11) is identified by the fact that the machine description contains information as to which of its functionalities process vectoral values and that the respective vector-processing functional unit (9) is divided on the vectoral value (13) to be processed respectively.

4. Process according to claims 1 and 2 *characterised by the fact* that discs are combined to a respective disk module (11), that the respective disk module (11) is identified by the fact that the machine description contains information as to which functional units can be divided into disks.

5. Process according to claims 1 and 2 *characterised by the fact* that discs are combined to a respective disk module (11), that the respective disk module (11) is identified by the fact that the machine description contains information as to which of the functional units process vectoral values, that the machine description contains information as to which functional units cannot be divided into disks and that these functional units are divided on the vectoral value (13) to be processed respectively, except the functional units, which are indicated as functionalities that cannot be divided into disks.

6. Process according to claims 3 to 5 *characterised by the fact* that a respective interconnecting network is produced between vector-processing functional units of the SIMD processor (14) by the fact that a respective disk module (11) is present identified, that a respective signal is realised in the machine description by the fact that it is represented within the disk module (11) via connections of a respectively unambiguously nameable internal connection (16) in the respective disk module (11).

7. Process according to claim 6 *characterised by the fact* that a disk-wide interconnecting network (8) is formed through a connection of a respective input connection of a first reduced functional unit (3) with a first and/or second output connection of a first and/or a second reduced functional unit (3),(4), in which the first reduced functional unit (3) lies within a disk of the disk module (11) and the second functional unit outside a disk of the disk module (11).

8. Process according to the claims 6 or 7 *characterised by the fact* that the respective connections of a first and/or a second disk (1), (2) is combined into a respective combining interconnecting network (7) of individual vector-value signals (Signal belongs to signals related to each other with several data elements).

9. Process according to claim 8 *characterised by the fact* that vector-value signals are divided on a first and a second disk (1) , (2) as individual connection from a combined interconnecting network (7) present respectively in an isolating interconnecting network (6). ,

10. Process according to one of the claims 6 or 7 *characterised by the fact* that a hierarchy-level interconnecting network (17) is formed through a connection of a respective input connection of the first reduced functional unit (3) with a first and/or second output connection of the first and/or a second reduced functional unit (3) , (4), in which the respective hierarchy-level interconnecting network (17) produces connections only in the respective hierarchy level.

11. Process according to claim 8 *characterised by the fact* that a disk-internal interconnecting network (5) is formed through a connection of a respective input connection of a first reduced functional unit (3) to a respective output connection of a second reduced functional unit of the first disk (1), in which the first and second reduced functional unit (3) , (4) lie within the disk module (11) and within the respective disk, that an additional signal of a connection of the disk is realised by the fact that a connection to the disk-internal interconnecting network (5) is made from the connection to the interface of the disk, in which this is represented as connection from and to connections nameable respectively unambiguously in the respective disk module.

12. Process according to claim 11 *characterised by the fact* that the respective connections of individual vector-value signals of several data elements of the next higher hierarchy level of a first and a second disk (1) , (2) are combined into a combining interconnecting network (7).